Appendix A. Proposed Regulation Order

Verification Procedure, Warranty and In-Use Compliance Requirements for In-Use Strategies to Control Emissions from Diesel Engines

§ 2700. Applicability.

These procedures apply to in-use strategies to control emissions of particulate matter (PM) and oxides of nitrogen (NOx) from diesel-fueled diesel engines. These strategies include but are not limited to, diesel particulate filters, diesel oxidation catalysts, fuel additives, selective catalytic reduction systems, exhaust gas recirculation systems, and alternative diesel fuels.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018 and 43105, 43600, 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, and 43204-43205.5 Health and Safety Code; Title 17 California Code of Regulations Section 93000.

§ 2701. Definitions

(a) The definitions in Section 1900(b), Chapter 1, Title 13 of the California Code of Regulations are incorporated by reference herein. The following definitions shall govern the provisions of this chapter:

(1) “15 ppmw or less sulfur fuel” means diesel fuel with a sulfur content equal to or less than 15 parts per million by weight (ppmw).

(2) “Alternative Diesel Fuel” means any fuel used in diesel engines that is not a reformulated diesel fuel as defined in Sections 2281 and 2282 of Title 13, of the California Code of Regulations, and does not require engine or fuel system modifications for the engine to operate, although minor modifications (e.g. recalibration of the engine fuel control) may enhance performance. Examples of alternative diesel fuels include, but are not limited to, biodiesel, Fischer Tropsch fuels, and emulsions of water in diesel fuel. Natural gas is not an alternative diesel fuel.

(3) “Applicant” means the entity that has applied for or has been granted verification under this Procedure.

(4) "Auxiliary Emission Control Device" (AECD) means any device or element of design that senses temperature, vehicle speed, engine revolutions per minute (RPM), transmission gear, manifold vacuum, or any other parameter for the purpose of activating, modulating, delaying, or deactivating the operation of the emission control system.

(5) “Average” means the arithmetic mean.

(6) “Backpressure Monitor” means a device that includes a sensor for measuring the engine backpressure upstream of a diesel emission control system and an indicator to notify the operator when the backpressure

exceeds specified high and in some cases low backpressure limits, as defined by the engine manufacturer or the applicant for verification of a diesel emission control strategy.

(7) “Baseline” means the test of a vehicle or engine without the diesel emission control strategy implemented.

(8) “Cold Start” means the start of an engine only after the engine oil and water temperatures are stabilized between 68 and 86 degrees F for a minimum of 15 minutes.

(9) "Defeat device" means an auxiliary emission control device (AECD) that reduces the effectiveness of the emission control system under conditions that may reasonably be expected to be encountered in normal vehicle operation and use, unless:

(A) such conditions are substantially included in the Federal emission test procedure;

(B) the need for the AECD is justified in terms of protecting the vehicle against damage or accident; or

(C) the AECD does not go beyond the requirements of engine starting.

(10) “Diesel emission control strategy” or “Diesel emission control system” means any device, system, or strategy employed with an in-use diesel vehicle or piece of equipment that is intended to reduce emissions. Examples of diesel emission control strategies include, but are not limited to, particulate filters, diesel oxidation catalysts, selective catalytic reduction systems, fuel additives used in combination with particulate filters, alternative diesel fuels, and combinations of the above.

(11) “Diesel Emission Control Strategy Family Name.” See Section 2706(g)(2).

(12) "Diesel Engine” means an internal combustion engine with operating characteristics significantly similar to the theoretical diesel combustion cycle. The primary means of controlling power output in a diesel cycle engine is by limiting the amount of fuel that is injected into the combustion chambers of the engine. A diesel cycle engine may be petroleum-fueled (i.e., diesel-fueled) or alternate-fueled.

(13) “Durability” means the ability of the applicant’s diesel emission control strategy to maintain a level of emissions below the baseline and maintain its physical integrity over some period of time or distance determined by the Executive Officer pursuant to these regulations. The minimum durability testing periods contained herein are not necessarily meant to represent the entire useful life of the diesel emission control strategy in actual service.

(14) “Emergency/Standby Engine” means an internal combustion engine used only as follows: (1) when normal power line or natural gas service fails; or (2) for the emergency pumping of water for either fire protection or flood relief. An engine operated to supplement a primary power source when the load capacity or rating of the primary power source has been either reached or exceeded is not an emergency/standby engine.

(15) “Emission control group” means a set of diesel engines and applications determined by parameters that affect the performance of a particular diesel emission control strategy. The exact parameters depend on the nature of the diesel emission control strategy and may include, but are not limited to, certification levels of engine emissions, combustion cycle, displacement, aspiration, horsepower rating, duty cycle, exhaust temperature profile, and fuel composition. Verification of a diesel emission control strategy and the extension of existing verifications are done on the basis of emission control groups.

(16) “Executive Officer” means the Executive Officer of the Air Resources Board or the Executive Officer’s designee.

(17) “Executive Order” means the document signed by the Executive Officer that specifies the verification level of a diesel emission control strategy for an emission control group and includes any enforceable conditions and requirements necessary to support the designated verification.

(18) “Fuel Additive” means any substance designed to be added to fuel or fuel systems that has any of the following effects: decreased emissions, improved fuel economy, increased performance of the entire vehicle or one of its component parts, or any combination thereof; or assists diesel emission control strategies in decreasing emissions, or improving fuel economy or increasing performance of a vehicle or component part, or any combination thereof.

(19) “Fuel Borne Catalyst” means a fuel additive containing one or more fuel-soluble metals, that acts as a catalyst to lower the temperature at which regeneration occurs within a diesel particulate filter.

(20) "Hot Start” means the start of an engine within four hours after the engine is last turned off. The first hot start test run should be initiated 20 minutes after the cold start for Federal Test Procedure testing following Section 86.1327-90 of the Code of Federal Regulations, Title 40, Part 86.

(21) “Portable Diesel-Fueled Diesel Engine” means a diesel-fueled diesel engine which is designed and capable of being carried or moved from one location to another and does not remain at a single location for more than 12 consecutive months. Engines used to propel mobile equipment or a motor vehicle of any kind are not portable engines. Examples of portable diesel-fueled engine applications include, but are not limited to cranes, pumps, welders, woodchippers, tactical support equipment (military), power generation sets, pile-driving hammers, service or work-over rigs, dredges or boats or barges, and compressors. The definitions in Title 13 California Code of Regulations Section 2452(g) and Section 2452(x) are incorporated by reference herein.

(22) “Regeneration”, in the context of diesel particulate filters, means the periodic or continuous combustion of collected particulate matter that is trapped in a particulate filter through an active or passive mechanism. Active regeneration requires a source of heat other than the exhaust itself to regenerate the particulate filter. Examples of active regeneration strategies include, but are not limited to, the use of fuel burners and

electrical heaters. Passive regeneration does not require a source of heat for regeneration other than the exhaust stream itself. Examples of passive regeneration strategies include, but are not limited to, the use of fuel-borne catalysts and the catalyst-coated particulate filter. In the context of NOx reduction strategies, "regeneration" means the desorption and reduction of NOx from NOx adsorbers (or NOx traps) during rich operating conditions.

(23) "Revoke" means to cancel the verification status of a diesel emission control strategy. If a diesel emission control strategy's verification status is revoked by the Executive Officer, the applicant must immediately cease and desist selling the diesel emission control strategy to end-users.

(24) "Stationary Diesel-Fueled Diesel Engine" means either a diesel-fueled diesel engine that is used in a piece of equipment that is designed to remain in one location for the duration of its useful life, or a diesel-fueled diesel engine that is used in a piece of equipment that can be moved from one location to another but remains in a single location for more than 12 consecutive months. Examples of stationary applications include, but are not limited, to electric power generator sets, grinders, rock crushers, sand screeners, cranes, cement blowers, compressors, and water pumps. The definitions in Title 13 California Code of Regulations Section 2452(g) and Section 2452(x) are incorporated by reference herein.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018 and 43105, 43600, 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, and 43204-43205.5 Health and Safety Code; Title 17 California Code of Regulations Section 93000.

§ 2702. Application Process

(a) Overview. Before submitting a formal application for the verification of a diesel emission control strategy for use with an emission control group, the applicant must submit a proposed verification testing protocol (pursuant to Section 2702(b)) at the Executive Officer's discretion. To obtain verification, the applicant must conduct emission reduction testing (pursuant to Section 2703), durability testing (pursuant to Section 2704), a field demonstration (pursuant to Section 2705), and submit the results along with comments and other information (pursuant to Sections 2706 and 2707) in an application to the Executive Officer, in the format shown in Section 2702(d). If the Executive Officer grants verification of a diesel emission control strategy, it will issue an Executive Order to the applicant identifying the verified emission reduction and any conditions that must be met for the diesel emission control strategy to function properly. After the Executive Officer grants verification of a diesel emission control strategy, the applicant must provide a warranty, conduct in-use compliance testing of the strategy after having sold a specified

number of units, and report the results to the Executive Officer (pursuant to Section 2709). A diesel emission control strategy that employs two or more individual systems or components must be tested and submitted for evaluation as one system. Applicants seeking verification of an alternative diesel fuel must follow the procedure described in Section 2710.

(b) Proposed Verification Testing Protocol. Before formally submitting an application for the initial verification of a diesel emission control strategy, the applicant must submit a proposed verification testing protocol at the Executive Officer's discretion. The protocol should include the following information:
(1) Identification of the contact persons, phone numbers, names and addresses of the responsible party proposing to submit an application.
(2) Description of the diesel emission control strategy's principles of operation and a schematic depicting operation.
(3) Preliminary parameters for defining emission control groups that are appropriate for the diesel emission control strategy. The Executive Officer will work with the applicant to determine appropriate emission control group parameters.
(4) The applicant's plan for meeting the requirements of Sections 2703-2706. Existing test data may be submitted for the Executive Officer's consideration. The protocol must focus on verification of the diesel emission control strategy for use with a single emission control group.

(c) If an applicant submits a proposed verification testing protocol, the Executive Officer shall, within 30 days of its receipt, determine whether the applicant has identified an appropriate testing protocol to support an application for verification and notify the applicant in writing that it may submit an application for verification. The Executive Officer may suggest modifications to the proposed verification testing protocol to facilitate verification of the diesel emission control strategy. All applications, correspondence, and reports must be submitted to:

Chief, Heavy-Duty Diesel In-Use Strategies Branch
Air Resources Board
9528 Telstar Avenue
El Monte, CA 91731

(d) Application Format. The application for verification of a diesel emission control strategy must follow the format shown below. If a section asks for information that is not applicable to the diesel emission control strategy, the applicant must indicate "not applicable."

1. Introduction

1.1 Identification of applicant, manufacturer, and product
1.2 Identification of type of verification being sought

1.2.1 Description of emission control group selected
1.2.2 Emission reduction claim

2. Diesel Emission Control Strategy Information

2.1 General description of the diesel emission control strategy
2.1.1 Discussion of principles of operation and system design
2.1.2 Schematics depicting operation
2.2 Description of regeneration method
2.2.1 Operating condition requirements for regeneration
2.2.2 Thresholds and control logic to activate regeneration
2.2.3 Description of backpressure monitor including threshold and control logic
2.3 Favorable operating conditions
2.4 Unfavorable operating conditions and associated reduction in performance
2.5 Fuel requirements and misfueling considerations
2.6 Identification of failure modes and associated consequences
2.7 Complete discussion of all potential safety issues *(e.g., uncontrolled regeneration, lack of proper maintenance, unfavorable operating conditions, etc.)*
2.8 Installation requirements
2.9 Maintenance requirements

3. Alternative Diesel Fuel Information

3.1 Information from Section 2710(b)
3.2 Emission control group compatibility considerations
3.3 Misfueling prevention strategies

4. Diesel Emission Control Strategy and Emission Control Group Compatibility

4.1 Compatibility with the engine
4.1.1 Discussion on calibrations and design features that may vary from engine to engine
4.1.2 Effect on overall engine performance
4.1.3 Effect on engine backpressure
4.1.4 Additional load on the engine
4.1.5 Effect on fuel consumption
4.1.6 Engine oil consumption considerations
4.2 Compatibility with the application
4.2.1 Dependence of calibration and other design features on application characteristics
4.2.2 Presentation of typical exhaust temperature profiles and other relevant field-collected data from representative applications within the emission control group
4.2.3 Comparison of field-collected application data with operating conditions suitable for the diesel emission control strategy

5. Testing Information

5.1 Emission reduction testing
- 5.1.1 Test facility identification
- 5.1.2 Description of test vehicle and engine *(make, model year, engine family name, etc.)*
- 5.1.3 Test procedure description *(de-greening period, test cycle, etc.)*
- 5.1.4 Test results and comments

5.2 Durability testing
- 5.2.1 Test facility identification
- 5.2.2 Description of field application (where applicable)
- 5.2.3 Description of test vehicle and engine *(make, model year, engine family name, etc.)*
- 5.2.4 Test procedure description *(field or bench, test cycle, etc.)*
- 5.2.5 Test results and comments
- 5.2.6 Summary of evaluative comments from third-party for in-field durability demonstration *(e.g., driver or fleet operator)*

5.3 Field demonstration (where applicable)
- 5.3.1 Field application identification
- 5.3.2 Description of test vehicle and engine *(make, model year, engine family name, etc.)*
- 5.3.3 Engine backpressure and exhaust temperature graphs with comments
- 5.3.4 Summary of evaluative comments from third-party *(e.g., driver or fleet operator)*

6. References

7. Appendices

A. Laboratory test report information *(for all tests)*
- A.1 Raw test data
- A.2 Plots of engine backpressure and exhaust temperature
- A.3 Driving traces for chassis dynamometer tests
- A.4 Quality assurance and quality control information

B. Third-party letters describing in-field performance

C. Diesel emission control system label

D. Owner's manual
- D.1 Installation procedure
- D.2 Maintenance requirements
- D.3 Backpressure monitor instructions (if applicable)
- D.4 Fuel requirements
- D.5 Fuel penalty
- D.6 Durability statement
- D.7 Warranty
- D.8 Information on wastes generated with warnings where appropriate
- D.9 Contact information for replacement components and maintenance supplies ("Contact your local distributor" is satisfactory)

D.10 Safety considerations

E. Other supporting documentation

(e) Within 30 days of receipt of the application, the Executive Officer shall notify the applicant whether the application is complete.

(f) Within 60 days after an application has been deemed complete, the Executive Officer shall determine whether the diesel emission control strategy merits verification and shall classify it as shown in Table 1:

Table 1. Verification Classifications for Diesel Emission Control Strategies

Pollutant	Reduction	Classification
PM	< 25%	Not verified
	$\geq$ 25% but < 50%	Level 1
	$\geq$ 50% but < 85%	Level 2
	$\geq$ 85%, or $\leq$ 0.01 g/bhp-hr	Level 3
NOx	< 15%	Not verified
	$\geq$ 15%	Verified in 5% increments

The applicant and the Executive Officer may mutually agree to a longer time period for reaching a decision, and additional supporting documentation may be submitted by the applicant before a decision has been reached. The Executive Officer shall notify the applicant of the decision in writing and specify the verification level for the diesel emission control strategy and identify any terms and conditions that are necessary to support the verification.

(g) Extensions of an Existing Verification. If the applicant has verified a diesel emission control strategy with one emission control group and wishes to extend the verification to include additional emission control groups, it may apply to do so using the original test data, additional test data, engineering justification and analysis, and any other information deemed necessary by the Executive Officer to address the differences between the emission control group already verified and the additional emission control group(s). Processing time periods follow sections (e) and (f) above.

(h) Design Modifications. If an applicant modifies the design of a diesel emission control strategy that has already been verified or is under consideration for verification by the Executive Officer, the modified version must be evaluated under this Procedure. The applicant must provide a detailed description of the design modification along with an explanation of how the modification will change the operation and performance of the diesel emission control strategy.

To support its claims, the applicant must submit additional test data, engineering justification and analysis, and any other information deemed necessary by the Executive Officer to address the differences between the modified and original designs. Processing time periods follow sections (e) and (f) above.

(i) Treatment of Confidential Information. Information submitted to the Executive Officer by an applicant may be claimed as confidential, and such information shall be handled in accordance with the procedures specified in Title 17, California Code of Regulations, Sections 91000-91022. The Executive Officer may consider such confidential information in reaching a decision on a verification application.

(j) The Executive Officer may lower the verification level or revoke the verification status of a verified diesel emission control strategy family if there are errors, omissions or inaccurate information in the application for verification or supporting information.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018 and 43105, 43600, 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, and 43204-43205.5 Health and Safety Code; Title 17 California Code of Regulations Section 93000.

§ 2703. Emission Testing Requirements.

(a) The applicant must test the diesel emission control strategy on an emission control group basis and identify the emission control group. The applicant must identify the test engines and vehicles, if applicable, by providing the engine family name, make, model, model year, and PM and NOx certification levels if applicable. The applicant must also describe the applications for which the diesel emission control strategy is intended to be used in by giving examples of in-use vehicles or equipment, characterizing typical duty cycles, indicating any fuel requirements, and/or providing other application-related information.

(b) Engine Pre-conditioning. The applicant may tune-up or rebuild test engines prior to, but not after, baseline testing unless rebuilding the engine is an integral part of the diesel emission control strategy. All testing should be performed with the test engine in a proper state of maintenance.

(c) Diesel Emission Control System Pre-conditioning. The engine installed with a diesel emission control system must be operated for a break-in period of between 25 and 125 hours before emission testing.

(d) Test Fuel.

(1) The test fuel must meet the specifications in the California Code of Regulations (Sections 2280 through 2283 of Title 13), with the exception of the sulfur content or other properties previously identified by the applicant and approved by the Executive Officer.

(2) If operation or performance of a diesel emission control strategy is affected by fuel sulfur content, the sulfur content of the test fuel must be no less than 66 percent of the stated maximum sulfur content for the diesel emission control strategy, unless

(A) the testing is performed with fuel containing 15 ppmw or less sulfur for verification on 15 ppmw or less sulfur diesel fuel, or

(B) the testing is performed with diesel fuel commercially available in California for verification on CARB diesel fuel (i.e., fuel meeting the specifications in Title 13, California Code of Regulations, Sections 2280 through 2283).

(3) Baseline testing may be conducted with commercially available diesel fuel or diesel fuel with 15 ppmw or less sulfur. Baseline and control tests must be performed using the same fuel unless the control fuel is specified as a component of the emission control strategy.

(4) The test fuel (or batch of fuel purchased) must be analyzed using American Society for Testing and Materials (ASTM) test methods listed in Table 6, which are incorporated herein by reference. At a minimum, sulfur content, aromatic content, polycyclic aromatic hydrocarbons, nitrogen content, and cetane number must be reported. The Executive Officer may ask for additional properties to be reported if evidence suggests those properties may affect functioning of the diesel emission control strategy.

(e) Test Cycle. The diesel emission control strategy must be tested using the test cycles indicated in subparagraphs 1-3 below (summarized in Table 2) or with alternative cycle(s) approved by the Executive Officer pursuant to subsection (f) below.

Table 2. Test Cycles for Emission Reduction Testing*

Test Type	On-Road	Off-Road (including portable engines)	Stationary
Engine	FTP Heavy-duty Transient Cycle (1 cold-start and 3 hot-starts)	Steady-state test cycle from ARB off-road regulations (3 hot-starts)	Steady-state test cycle from ARB off-road regulations (3 hot-starts)
Chassis	UDDS (1 cold-start and 3 hot-starts) and ARB approved test cycle per 2703 (f) (3 hot-starts).	Not Applicable	Not Applicable

* Additional hot-starts are required for NOx emission reduction between 15 to 25 percent (see Section 2703(h)).
FTP = Federal Test Procedure; UDDS = Urban Dynamometer Driving Schedule

(1) On-road Engines and Vehicles. For on-road diesel-fueled vehicles, the applicant may choose between engine dynamometer testing and chassis dynamometer testing, subject to the following conditions. Engine testing may be used for verification of an absolute engine emissions level or a percent emission reduction. Chassis testing may be used only to verify a percent emission reduction. The applicant may use emission test data to satisfy the durability test data requirement, but must follow the same testing option for the remaining durability tests (see Section 2704).
   (A) Engine testing must consist of one cold-start and at least three hot-start tests using the Federal Test Procedure (FTP) Heavy-duty Transient Cycle for engines used in on-road applications, in accordance with the provisions in the Code of Federal Regulations, Title 40, Part 86, Subpart N.
   (B) The applicant must conduct all chassis tests in accordance with the provisions of the Code of Federal Regulations, Title 40, Part 86, Subpart N insofar as they pertain to chassis dynamometer testing. Chassis testing must include two separate test cycles as follows:
      (i) One cold-start and at least three hot-start tests using the Urban Dynamometer Driving Schedule (UDDS) (see Code of Federal Regulations, Title 40, Part 86, appendix I (d)).
      (ii) Three hot-start tests using a low-speed chassis test cycle representing urban stop-and-go traffic operation. The test cycle must include a repetitive series of idling periods immediately followed by events of maximum vehicle acceleration. The applicant can propose, for Executive Officer approval, a low-speed cycle as applicable to the type of vehicle and vehicle operation for which the diesel emission control strategy is intended. The Executive Officer will provide examples (e.g., New York Bus Cycle) of appropriate test cycles upon request by the applicant during the verification process.
   (C) For any diesel emission control strategy intended to reduce NOx from on-road applications, the applicant must perform 3 hot-start tests with an additional test cycle that triggers all defeat devices associated with the engine (e.g., lean-on-cruise strategies). The engine or chassis test cycle may be proposed by the applicant and must be approved by the Executive Officer. The Executive Officer will evaluate the proposed test cycle based on the following criteria:
      (i) Representativeness of real-life operation, and
      (ii) Consistency with established procedures for determining off-cycle emissions.

(2) Off-road Engines and Equipment (including portable engines). For off-road diesel-fueled vehicles and equipment, the applicant must follow the steady-state test cycle outlined in the ARB off-road regulations (California Code of Regulations, Title 13, Section 2423 and the incorporated California Exhaust Emission Standards and Test Procedures for New 2000 and Later Off-Road Compression-Ignition Engines, Part I-B). A minimum of three hot-start tests must be conducted for each appropriate test cycle.

(3) Stationary Engines. For stationary engines, the applicant must use the most appropriate off-road test cycle (as referenced in (2) above) representing the operating conditions of the application, with approval from the Executive officer. A minimum of three hot-start tests must be conducted for each appropriate test cycle.

(f) Alternative Test Cycles and Methods. The applicant may request the Executive Officer to approve an alternative test cycle or method in place of a required test cycle or method. In reviewing this request, the Executive Officer may consider all relevant information including, but not limited to, the following:

(1) Similarity of average speed, percent of time at idle, average acceleration, and other characteristics to the specified test cycle or method and in-use duty cycle,

(2) Body of existing test data generated using the alternative test cycle or method,

(3) Technological necessity, and

(4) Technical ability to conduct the required test.

(g) Test Run. The number of tests indicated in Table 2 must be run for both baseline (without the diesel emission control strategy implemented) and control configurations. For filter-based strategies, engine backpressure and exhaust temperature must be measured and recorded on a second-by-second basis (1 Hertz) during at least one baseline run and each of the control test runs.

(h) Verification of NOx Emission Reductions. The procedure for verifying NOx reductions depends on the magnitude and nature of the claimed reductions as follows:

(1) For NOx reductions of 25 percent or more below the baseline NOx emissions, the testing protocol described in (e) may be used.

(2) For NOx reductions of less than 25 percent below the baseline NOx emissions, additional hot-start test runs are required to attain equivalent confidence in the results.

(A) For NOx reductions equal to or more than 20 percent, but less than 25 percent, each set of three hot-starts in paragraph (e) above must be augmented to five hot-starts

(B) For NOx reductions equal to or more than 15 percent, but less than 20 percent, each set of three hot-starts in paragraph (e) above must be augmented to nine hot-starts.

(i) Emissions During Particulate Filter Regeneration Events. For any diesel emission control strategy that has a distinct regeneration event, emissions that occur during the event must be measured and taken into account when determining the net emission reduction efficiency of the system. If a regeneration event will not occur during emission testing, applicants may pre-load the diesel emission control system with diesel PM to force such an event to occur during testing, subject to the approval of the Executive Officer. Applicants must provide data or engineering analysis indicating when events occur on test cycles and in actual operation (e.g., backpressure data).

(j) Results. For all completed emission tests, the applicant must report emissions of total PM, non-methane hydrocarbons or total hydrocarbons (whichever is used for the relevant engine or vehicle certification), oxides of nitrogen, nitrogen dioxide, carbon monoxide, and carbon dioxide.

(1) For mobile sources, or for engines tested using an engine dynamometer, emissions must be reported in grams/mile (g/mile) or grams/brake horsepower-hour (g/bhp-hr).

(2) For stationary engines, gaseous and particulate matter emissions must be reported as required by the test methods approved by the Executive Officer.

(k) Incomplete and Aborted Tests. The applicant must identify all incomplete and aborted tests and explain why those tests were incomplete or aborted.

(l) Additional Exhaust Analyses. The Executive Officer may require the applicant to perform additional exhaust analyses if there is reason to believe that the use of a diesel emission control strategy may result in the increase of toxic air contaminants, other harmful compounds, or a change in the nature or amount of the emitted particulate matter.

(1) In its determination, the Executive Officer may consider all relevant data, including but not limited to the following:

(A) The addition of any substance to the fuel, intake air, or exhaust stream

(B) Whether a catalytic reaction is known or reasonably suspected to increase toxic air contaminants or ozone precursors

(C) Results from scientific literature

(D) Field experience and

(E) Any additional data.

(2) These additional analyses may include, but are not limited to, measurement of the following:

(A) Benzene

(B) 1,3-butadiene

(C) Formaldehyde

(D) Acetaldehyde
(E) Polycyclic aromatic hydrocarbons (PAH)
(F) Nitro-PAH
(G) Dioxins
(H) Furans

(m) Quality Control of Test Data. The applicant must provide information on the test facility, test procedure, and equipment used in the emission testing. For data gathered using on-road and off-road test cycles and methods, applicants must provide evidence establishing that the test equipment used meets specifications and calibrations given in the Code of Federal Regulations, Title 40, Part 85, subpart N.

(n) The Executive Officer may, with respect to any diesel emission control strategy sold, offered for sale, or manufactured for sale in California, order the applicant or strategy manufacturer to make available for testing and/or inspection a reasonable number of diesel emission control systems, and may direct that they be delivered at the applicant's expense to the state board at the Haagen-Smit Laboratory, 9528 Telstar Avenue, El Monte, California or where specified by the Executive Officer. The Executive Officer may also, with respect to any diesel emission control strategy being sold, offered for sale, or manufactured for sale in California, have an applicant test and/or inspect a reasonable number of units at the applicant or manufacturer's facility or at any test laboratory under the supervision of the Executive Officer.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018 and 43105, 43600, 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, and 43204-43205.5 Health and Safety Code; Title 17 California Code of Regulations Section 93000.

§ 2704. Durability Testing Requirements

(a) The applicant must demonstrate, to the satisfaction of the Executive Officer, the durability of the applicant's diesel emission control strategy through an actual field or laboratory-based demonstration combined with chassis or engine dynamometer-based emission tests. If the applicant chooses a laboratory-based durability demonstration, an additional field demonstration will be required to demonstrate in-field compatibility (pursuant to Section 2705). If the applicant has demonstrated the durability of the identical system in a prior verification or has demonstrated durability through field experience, the applicant may request that the Executive Officer accept the previous demonstration in fulfillment of this requirement. In evaluating such a request, the Executive Officer may consider all relevant information including, but not limited to, the similarity of baseline emissions and application duty cycles, the

relationship between the emission control group used in previous testing and the current emission control group, the number of engines tested, evidence of successful operation and user acceptance, and published reports.

(b) Engine Selection. Subject to the approval of the Executive Officer, the applicant may choose the engine and application to be used in the durability demonstration. The engine and application must be representative of the emission control group for which verification is sought. The selected engine need not be the same as the engine used for emission testing, but if the applicant does use the same engine, the emission testing may also be used for the initial durability tests.

(c) Test Fuel.

(1) The test fuel must meet the specifications in the California Code of Regulations (Sections 2280 through 2283 of Title 13), with the exception of the sulfur content or other properties previously identified by the applicant and approved by the Executive Officer.

(2) If operation or performance of a diesel emission control strategy is affected by fuel sulfur content, the sulfur content of the test fuel must be no less than 66 percent of the stated maximum sulfur content for the diesel emission control strategy, unless

(A) the testing is performed with fuel containing 15 ppmw or less sulfur for verification on 15 ppmw or less sulfur diesel fuel, or

(B) the testing is performed with diesel fuel commercially available in California for verification on CARB diesel fuel (i.e., fuel meeting the specifications in Title 13, California Code of Regulations, Sections 2280 through 2283).

(3) Baseline testing may be conducted with commercially available diesel fuel or diesel fuel with 15 ppmw or less sulfur. Baseline and control tests must be performed using the same fuel unless the control fuel is specified as a component of the emission control strategy.

(4) The test fuel (or batch of fuel purchased) must be analyzed using American Society for Testing and Materials (ASTM) test methods listed in Table 6, which are incorporated herein by reference. At a minimum, sulfur content, aromatic content, polycyclic aromatic hydrocarbons, nitrogen content, and cetane number must be reported. The Executive Officer may ask for additional properties to be reported if evidence suggests those properties may affect functioning of the diesel emission control strategy.

(d) Service Accumulation. The durability demonstration consists of extended periods of time in which the diesel emission control strategy is implemented in the field or in a laboratory, with periodic emission reduction testing.

(1) Minimum Durability Demonstration Periods. The minimum durability demonstration periods are shown in Table 3, below. For filter-based strategies, engine backpressure and exhaust temperature must be measured and recorded for 1000 hours or over the entire durability period

(whichever is shorter) with a sampling period not to exceed two minutes (120 seconds). Data must be submitted electronically in columns as a text file or another format approved by the Executive Officer.

Table 3. Minimum Durability Demonstration Periods

Engine Type	Minimum Durability Demonstration Period
On-Road	50,000 miles or 1000 hours
Off-Road (including portable engines) and Stationary	1000 hours
Stationary emergency generator	500 hours

(2) Fuel for Durability Demonstrations. The fuel used during durability demonstrations should be equivalent to the test fuel, or a fuel with properties less favorable to the durability of the emission control strategy. Durability demonstrations may, at the applicant's option and with the Executive Officer's approval, include intentional misfueling events so that data on the effects of misfueling may be determined.

(e) Third-Party Statement for In-field Durability Demonstrations. For in-field durability demonstrations, the applicant must provide a written statement from an Executive Officer approved third party, such as the owner or operator of the vehicle or equipment used, at the end of the durability period. The statement must describe overall performance, maintenance required, problems encountered, and any other relevant comments. The results of a visual inspection conducted by the third party at the end of the demonstration period must also be described. The description should comment on whether the diesel emission control strategy is physically intact, securely mounted, leaking any fluids, and should include any other evaluative observations.

(f) Test Cycle. Testing requirements are summarized in Table 4. Note that the same cycle(s) must be used for both the initial and final tests.

(1) On-Road Applications. The applicant must perform either chassis or engine dynamometer-based testing at the beginning and end of the durability period as specified in Table 4. A minimum of one cold-start and three hot-start tests are required. Chassis testing requires an additional three hot-starts on a second cycle as described in Section

2703(e)(1)(B)(ii). If a field durability demonstration is selected, the applicant must perform chassis dynamometer testing, or request that the Executive Officer consider engine dynamometer testing. In reviewing the request, the Executive Officer may consider all relevant information, including, but not limited to the following:

(A) Similarity of the field vehicle's engine to the laboratory engine, and

(B) Similarity of the diesel emission control system's calibration and set-up when installed on the field vehicle to that when installed on the laboratory engine.

(2) Off-road and Stationary Applications. The applicant must use the same cycle for the emission reduction testing as defined in Section 2703. A minimum of three hot-start tests is required.

(g) Test Run. The requirements for emissions reduction testing are summarized in Table 4, below. The diesel emission control strategy must undergo one set of emission tests at the beginning and end of the durability demonstration period. Baseline testing with test repetitions as indicated in Table 4 must be conducted for either the initial test or the final test, but is suggested for both. If there are substantial test data from previous field studies or field demonstrations, applicants may request that the Executive Officer consider these in place of the initial emission tests. For filter-based strategies, engine backpressure and exhaust temperature must be measured and recorded on a second-by-second basis (1 Hertz) during at least one baseline run and each of the control test runs.

Table 4. Emission Tests Required for Durability Demonstrations

Application	Test Type	Initial Test (0% of durability period) Final Test (100% of durability period)
On-Road	Engine	FTP Heavy-duty Transient Cycle (1 cold and 3 hot-starts)
	Chassis	UDDS (1 cold and 3 hot-starts) and ARB-approved low-speed test cycle (3 hot-starts)
Off-Road and portable engines	Engine	Steady-state test cycle from ARB off-road regulations or an alternative cycle (3 hot-starts)
Stationary	Engine	Steady-state test cycle from ARB off-road regulations or an alternative cycle (3 hot-starts)

(h) Maintenance During Durability Demonstration. Except for emergency engine repair, only scheduled maintenance on the engine and diesel emission control system and re-fill of additives (if any) may be performed during the durability demonstration. If normal maintenance includes replacement of any

component of the diesel emission control system, the time (miles, years, or hours) between component change or refill must be reported with the results of the demonstration.

(i) Performance Requirements. The diesel emission control strategy must meet the following requirements throughout the durability demonstration period:
(1) If the applicant claims a percent emission reduction, the percent emission reduction must meet or exceed the initial verified percent emission reduction level.
(2) If the applicant claims to achieve 0.01 g/bhp-hr, the emission level must not exceed the 0.01 g/bhp-hr emission level.
(3) The diesel emission control system must maintain its physical integrity. Its physical structure and all of its components not specified for regular replacement during the durability demonstration period must remain intact and fully functional.
(4) The diesel emission control strategy must not cause any damage to the engine.
(5) The backpressure caused by the diesel emission control strategy should not exceed the engine manufacturer's specified limits, or must not result in any damage to the engine.
(6) No maintenance of the diesel emission control system beyond that specified in its owner's manual will be allowed without prior Executive Officer approval.

(j) Conditional Verification for Off-road and Stationary Applications. If the Executive Officer determines that the diesel emission control strategy is technologically sound and appropriate for the intended application, he may grant a conditional verification for off-road and stationary applications upon completion of 33 percent of the minimum durability period. In making this determination, the Executive Officer may consider all relevant information including, but not limited to, the following: the design of the diesel emission control system, filter and catalyst substrates used, similarity of the system under consideration to verified systems, the intended application of the diesel emission control system, other relevant testing data, and field experience. Where conditional verification is granted, full verification must be obtained by completing the durability testing and all other remaining requirements. These requirements must be completed within a year after receiving conditional verification if laboratory testing is chosen and within three years if field testing is chosen. For the aforementioned time periods, conditional verification is equivalent to verification for the purposes of satisfying the requirements of in-use emission control regulations.

(k) Failure During the Durability Demonstration Period. If the diesel emission control strategy fails to maintain its initial verified percent emission reduction or emission level for any reason, the Executive Officer may downgrade the strategy to the verification level which corresponds to the lowest degraded

performance observed in the durability demonstration period. If the diesel emission control strategy fails to maintain at least a 25 percent PM reduction or 15 percent NOx reduction at any time during the durability period, the diesel emission control strategy will not be verified. If the diesel emission control strategy fails in the course of the durability demonstration period, the applicant must submit a report explaining the circumstances of the failure within 90 days of the failure. The Executive Officer may then determine whether to deny verification or allow the applicant to correct the failed diesel emission control strategy and either continue the durability demonstration or begin a new durability demonstration.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018 and 43105, 43600, 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, and 43204-43205.5 Health and Safety Code; Title 17 California Code of Regulations Section 93000.

§ 2705. Field Demonstration Requirements.

(a) The applicant must demonstrate compatibility of its diesel emission control strategy in the field with at least one vehicle or piece of equipment belonging to the initial emission control group for which it seeks verification. Note that if the durability demonstration selected by the applicant is in-field, it may be used to satisfy the field demonstration requirement for that emission control group.

(1) Compatibility is determined by the Executive Officer based on the third-party statement (see part (c) of this section) and any other data submitted including backpressure data. A diesel emission control strategy is compatible with the chosen application if it:

(A) Does not cause damage to the engine or engine malfunction

(B) Does not cause backpressure outside of the engine manufacturer's specified limits or which results in any damage to the engine

(C) Does not hinder or detract from the vehicle or equipment's ability to perform its normal functions

(D) Is physically intact and well mounted with no signs of leakage or other visibly detectable problems

(2) To determine whether additional emission control groups require separate field demonstrations, the Executive Officer may consider all relevant information, including, but not limited to existing field experience and engineering justification and analysis.

(b) Test Period.

(1) For on- and off-road engines, and stationary engines not used in emergency generators, a vehicle or piece of equipment must be operated

with the diesel emission control strategy installed for a minimum period of 200 hours or 10,000 miles, whichever occurs first.

(2) For stationary emergency generators, the emission control system must remain in the field for at least 30 days and operation must include:

(A) 12 maintenance runs (allowing for engine cool down between runs), and

(B) a minimum of two separate 4 hour sessions where the engine is operated under load (allowing engine cool down between runs).

(c) Reporting Requirements.

(1) For filter-based strategies, engine backpressure and exhaust temperature must be measured and recorded over the entire demonstration period with a sampling period not to exceed two minutes (120 seconds). Data must be submitted electronically in columns as a text file or another format approved by the Executive Officer.

(2) The applicant must provide a written statement from a third party approved by the Executive Officer, such as the owner or operator of the vehicle or equipment used in the field demonstration. The written statement must be provided at the end of the test period and must describe the following aspects of the field demonstration: overall performance of the test application and the diesel emission control strategy, maintenance performed, problems encountered, and any other relevant information. The results of a visual inspection conducted by the third party at the end of the demonstration period must also be described. The description should comment on whether the diesel emission control strategy is physically intact, securely mounted, leaking any fluids, and should include any other evaluative observations.

(d) Failure During Field Demonstration. If the diesel emission control strategy fails in the course of the field demonstration, the applicant must submit a report explaining the circumstances of the failure within 90 days of the failure. The Executive Officer may then determine whether to deny verification or allow the applicant to correct the failed diesel emission control strategy and either continue the field demonstration or begin a new field demonstration.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018 and 43105, 43600, 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, and 43204-43205.5 Health and Safety Code; Title 17 California Code of Regulations Section 93000.

§ 2706. Other Requirements.

(a) Limit and Procedure for Measuring Nitrogen Dioxide (NO_2).
  (1) The NO_2 emissions associated with the use of a diesel emission control strategy must not exceed 20 percent of the total baseline NOx emissions on a mass basis.
  (2) NO_2 emissions are to be quantified by employing two chemiluminescence analyzers simultaneously fed from a common heated sample path. One instrument shall be set to NOx mode, while the second shall be set to NO mode. The instrument set to NOx mode receives a sample that has passed through an NO_2-to-NO converter, and the resultant concentration is designated as total NOx ($NO+NO_2$) in the sample. The instrument that is set to NO mode receives a sample that has not passed through the converter and quantifies the amount of NO only. The difference between NO and NOx is the amount of NO_2 in the sample. Both analyzer signals are recorded by an external data acquisition system at 1 Hertz. The column data for each analyzer is then adjusted for time delays that are inherent in both instruments and the sample path. Once the data file is correctly aligned, a subtraction of NO from NOx is performed on a second by second basis. The result of this subtraction is then integrated over the entire test run. The result of this integration is the amount of NO_2 over the entire test cycle in PPM. The equation for calculating total NOx (Code of Federal Regulations, Title 40, part 86, Subpart N) is then used to generate a gram per mile or g/bhp-hr NO_2 value.

(b) Limits on Other Pollutants. In order to be verified, a diesel emission control strategy must not increase the emissions of criteria pollutants (i.e., NMHC, CO, and NOx) greater than ten percent from the baseline level.

(c) Fuel Additives. Diesel emission control strategies that use fuel additives must meet the following additional requirements for verification. Fuel additives must be used in combination with a diesel particulate filter unless they can be proven to the satisfaction of the Executive Officer to be safe for use alone. In addition, the applicant must meet the following requirements:
  (1) The applicant must submit the exact chemical formulation of the fuel additive,
  (2) Diesel emission control systems employing the dosing of an additive in conjunction with a diesel particulate filter must include an on-board monitor of the additive level in the reservoir, integrated with the diesel particulate filter. The on-board monitor for fuel additive must include indicators to notify the operator when the additive level becomes low and when the additive tank is empty. In addition, the on-board monitor must be capable of shutting off additive, if there is a detected diesel particulate filter problem,
  (3) The applicant must submit to the Executive Officer environmental, toxicological, epidemiological, and other health-related data pertaining to

the fuel additive every two years. The Executive Officer will review the data, including any new information, and may revoke the verification if the data indicate that the fuel additives cause, or are linked, to negative environmental, or health consequences.

(4) The applicant must conduct additional emission tests of fuel additives that contain metals.

(A) Except as provided (B) below, the additional emission tests must follow the same test procedures, test cycles, and number of test runs as indicated in Section 2703, except that the concentration of metal must be at least 50 ppm or 10 times higher than that specified for normal use, whichever is highest. In all other respects, the metal in the high concentration test solutions must be identical to that in the fuel additive submitted for verification.

(B) The applicant may petition to use a concentration of metal less than 50 ppm, if the higher dose would result in catastrophic damage to the engine. The applicant must supply information on the failure modes, and the level of additive that would trigger failure. The applicant must also supply information and data supporting the highest feasible dose for testing. An increase in emissions is not by itself sufficient to justify a dose lower than 50 ppm and must be correlated to potential engine damage. After reviewing this information and any other relevant information, the Executive Officer shall determine if testing at a lower level could be accepted, or if testing must be conducted at 50 ppm or ten times the specified dose rate as required in (A).

(d) Engine Backpressure and Monitoring. During the emission and durability testing, the applicant must demonstrate that the backpressure caused by its diesel emission control system is within the engine manufacturer's specified limits, or will not result in any damage to the engine. Furthermore,

(1) If operation of the engine with the diesel emission control system installed will result in a gradual build-up of backpressure exceeding the engine's specified limits over time (such as due to the accumulation of ash), information describing how the backpressure will be reduced must be included.

(2) All filter-based diesel emission control systems must be installed with a backpressure monitor to notify the operator when the high backpressure limit, as specified by the engine manufacturer or included in the verification, is approached. The applicant must identify the high backpressure limits of the system in its application for verification.

(3) The Executive Officer reserves the right to require monitors that identify low backpressure limits in those cases where failures leading to low backpressure are unlikely to be detected, or have the potential to cause environmental damage beyond that caused by the engine prior to being equipped with the emission control strategy (e.g., systems that introduce additives into the fuel).

(e) Fuel and Oil Requirements. The applicant must specify the fuel and lubricating oil requirements necessary for proper functioning of the diesel emission control system. The applicant must also specify any consequences that will be caused by failure to comply with these requirements, as well as methods for reversing any negative consequences.

(f) Maintenance Requirements. The applicant must identify all normal maintenance requirements for the diesel emission control system. The applicant must specify the recommended intervals for cleaning and/or replacing components. Any components to be replaced within the defects warranty period must be covered with the original diesel emission control system package or provided free of charge to the customer at the appropriate maintenance intervals. Any normal maintenance items that the applicant does not intend to provide free of charge must be approved by the Executive Officer. In addition, the applicant must specify procedures for proper handling of spent components and/or materials cleaned from the diesel emission control system. If any such materials are hazardous, the applicant must identify them as such in the owner's manual. For filter-based diesel emission control strategies, the applicant must include procedures for resetting any backpressure monitors after maintenance procedures are completed.

(g) System Labeling.

(1) The applicant must affix a legible and durable label on both the diesel emission control system and the engine on which the diesel emission control system is installed. This label must identify the name, address, and phone number of the manufacturer, the diesel emission control strategy family name (defined in (2) below), a unique serial number, and the month and year of manufacture. A scale drawing of a sample label must be submitted with the verification application. The label information must be in the following format:

Name, Address, and Phone Number of Manufacturer
Diesel Emission Control Strategy Family Name
Product Serial Number
ZZ-ZZ (Month and Year of manufacture, e.g., 06-02)

(2) Diesel Emission Control Strategy Family Name. Each diesel emission control strategy shall be assigned a family name defined as below:

CA/MMM/YYYY/PM#/N##/APP/XXXXX

CA:	Designates a diesel emission control strategy verified in California
MMM:	Manufacturer code (assigned by ARB)
YYYY:	Year of manufacture
PM#:	PM verification level 1, 2, or 3 (e.g., PM3 means a level 3 PM emission control system).
N##:	NOx verified reduction level in percent, if any (e.g., N25 means NOx reduction of 25 percent).
APP:	ON: On-road OF: Off-road ST: Stationary
XXXXX:	Five alphanumeric character code issued by the ARB

(h) Additional Information. The Executive Officer may require the applicant to provide additional information about the diesel emission control strategy or its implementation when such information is needed to assess environmental impacts associated with its use.

(i) Owner's Manual. The applicant must provide a copy of the diesel emission control system owner's manual, which must clearly specify at least the following information:

(1) Warranty statement including the warranty period over which the applicant is liable for any defects.
(2) Installation and maintenance requirements for the diesel emission control system.
(3) Possible backpressure range imposed on the engine.
(4) Fuel consumption penalty, if any.
(5) Fuel sulfur limit, if any.
(6) Handling and supply of additives, if any.
(7) Instructions for reading and resetting the backpressure monitor.
(8) Requirements for lubrication oil quality and maximum lubrication oil consumption rate.
(9) Contact information for replacement components and cleaning agents.
(10) Contact information to assist an end-user to determine proper ways to dispose of waste generated by the diesel emission control strategy (e.g., ash accumulated in filter-based systems). At a minimum, the owner's manual should indicate that disposal must be in accordance with all applicable Federal, State and local laws governing waste disposal.

(j) Noise Level Control. Any diesel emission control system that replaces a muffler must continue to provide at a minimum the same level of exhaust noise attenuation as the muffler with which the vehicle was originally equipped by the applicant. Applicants must ensure that the diesel emission control system

complies with all applicable noise limits contained in Part 205, Title 40, Code of Federal Regulations and California Vehicle Code, Sections 27150, 27151 and 27200 through 27207, for the gross vehicle weight rating and year of manufacture of the vehicle for which the diesel emission control strategy is intended. Applicants must maintain a list of the types of vehicles (make, model, engine, gross vehicle weight rating, and year of manufacture) for which the diesel emission control strategy complies with all applicable noise limits contained in Part 205, Title 40, Code of Federal Regulations and California Vehicle Code Sections 27150, 27151 and 27200 through 27207. Diesel emission control systems may not be installed on vehicles not on that list.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018 and 43105, 43600, 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, and 43204-43205.5 Health and Safety Code; Title 17 California Code of Regulations Section 93000.

§ 2707. Warranty Requirements.

(a) Warranty. The applicant shall warrant to the ultimate purchaser and to each subsequent purchaser that its verified diesel emission control strategy is free from defects in design, materials, workmanship or operation which cause the diesel emission control strategy to fail to conform to the emission control performance level it was verified to, or to the other requirements of Sections 2700-2706, for the minimum periods shown in Table 5, below. For each engine type and size listed in Table 5, below, the minimum defects warranty period is terminated by that listed event which occurs first. The warranty shall cover the full replacement cost of the diesel emission control strategy, including parts and labor. The warranty shall also cover the full repair or replacement cost, including parts and labor, for damage to the engine or other vehicle components proximately caused by the verified diesel emission control strategy. Repair or replacement of any warranted part, including the engine and other parts, shall be performed at no charge to the vehicle or engine owner. This includes diagnostic expenses. The repair or replacement of any warranted part otherwise eligible for warranty coverage, shall be excluded from such warranty coverage if the applicant demonstrates that the diesel emission control strategy, vehicle or engine has been abused, neglected, or improperly maintained, and that such abuse, neglect, or improper maintenance was the direct cause of the need for the repair or replacement of the part. Failure of the vehicle or engine owner to ensure scheduled maintenance or to keep maintenance records shall not, per se, be grounds for disallowing a warranty claim.

Table 5. Minimum Warranty Periods

Engine Type	Engine Size	Minimum Warranty Period
On-Road	Light heavy-duty, 70 to 170 hp, Gross Vehicle Weight Rating (GVWR) less than 19,500 lbs.	5 years or 60,000 miles
	Medium heavy-duty, 170 to 250 hp, GVWR from 19,500 lbs. to 33,000 lbs.	5 years or 100,000 miles
	Heavy heavy-duty, exceeds 250 hp, GVWR exceeds 33,000 lbs.	5 years or 150,000 miles
Off-Road (includes portable engines) and Stationary	Under 25 hp, and for constant speed engines rated under 50 hp with rated speeds greater than or equal to 3,000 rpm	3 years or 1,600 hours
	At or above 25 hp and under 50 hp	4 years or 2,600 hours
	At or above 50 hp	5 years or 4,200 hours

(b) Diesel Emission Control Strategy Warranty Statement. The applicant must furnish a copy of the following statement in the owner's manual.

YOUR WARRANTY RIGHTS AND OBLIGATIONS

(Applicant's name) must warrant the diesel emission control system in the application for which it is sold for the periods of time listed below, provided there has been no abuse, neglect, or improper maintenance of your vehicle or equipment. This warranty also covers other vehicle parts from damaged caused by the diesel emission control system, subject to the same exclusions for abuse, neglect or improper maintenance of your vehicle or equipment. Your diesel emission control system may include a core part (e.g., particulate filter, diesel oxidation catalyst, selective catalytic reduction converter) as well as hoses, connectors, a back pressure monitor (if applicable), and other emission-related assemblies. Where a warrantable condition exists, (applicant's name) will repair or replace your diesel emission control system at no cost to you including diagnosis, parts, and labor.

APPLICANT'S WARRANTY COVERAGE:

For a (engine size) engine used in a(n) (type of application) application, the warranty period will be (time or mileage) whichever occurs first.

(1) If your (vehicle, engine, equipment) fails the in-use compliance test within the warranty period, all necessary repairs or part replacements will be made by (applicant's name) to ensure your PERFORMANCE WARRANTY.

(2) If any emission-related part of your diesel emission control system is defective in any way, the part will be repaired or replaced by (applicant's name) to ensure your DEFECT WARRANTY.

OWNER'S WARRANTY RESPONSIBILITY

As the (vehicle, engine, equipment) owner, you are responsible for performing the required maintenance described in your owner's manual. (Applicant's name) recommends that you retain all receipts for diesel emission control system maintenance expenses, but (applicant's name) cannot deny warranty solely because you do not keep your receipts or fail to perform all scheduled maintenance. You are responsible for presenting your diesel emission control system to a (applicant's name) dealer as soon as a problem is detected. The warranty repair or replacement should be completed in a reasonable amount of time, not to exceed 30 days.

If you have questions regarding your warranty rights and responsibilities, you should contact (Insert chosen applicant's contact) at 1-800-xxx-xxxx or the California Air Resources Board at 9528 Telstar Avenue, El Monte, CA 91731, or (800) 363-7664, or electronic mail: helpline@arb.ca.gov.

(c) Diesel Emission Control Strategy Warranty Report. The applicant must submit a warranty report to the Executive Officer by February 1 of each calendar year which includes the following information:

(1) Annual and cumulative sales of diesel emission control systems (California only).

(2) Annual and cumulative production of diesel emission control systems (California only).

(3) Annual summary of warranty claims. The summary must include:

(A) A description of the nature of the claims and of the warranty replacements or repairs. The applicant must categorize warranty claims for each diesel emission control strategy family by the component(s) replaced or repaired.

(B) The number and percentage of diesel emission control systems of each model for which a warranty replacement or repair was identified.

(C) A short description of the diesel emission control system component that was replaced or repaired under warranty and the most likely reason for its failure.

(4) Date the warranty claims were filed and the engine family and application the diesel emission control systems were used with.

(5) Delineate the reason(s) for any instances in which warranty service is not provided to end-users that file warranty claims.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018 and 43105, 43600, 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, and 43204-43205.5 Health and Safety Code; Title 17 California Code of Regulations Section 93000.

§ 2708. Determination of Emissions Reduction.

(a) Calculation of Emissions Reduction. The emissions reduction verified for a diesel emission control strategy is based on the average of all valid test results before (baseline) and after (control) implementation of the diesel emission control strategy. Test results from both emission testing and durability testing are to be used.

(1) Percentage Reduction. The percentage reduction for a given pair of baseline and control test sets (where a "set" consists of all test cycle repetitions, e.g., the test set of 1 cold and 3 hot-start UDDS tests) is the difference between the average baseline and average control emissions divided by the average baseline emissions, multiplied by 100 percent. The average of all such reductions, as shown in the equation below, is used in the verification of a diesel emission control strategy.

$$\text{Percentage Reduction} = 100\% \times \frac{\Sigma\,[(\text{baseline}_{AVG} - \text{control}_{AVG})/\text{baseline}_{AVG}]}{\text{Number of control test sets}}$$

Where:

Σ = sum over all control test sets

baseline_{AVG} or control_{AVG} = average of emissions from all baseline or control test repetitions within a given set

For any test set involving cold and hot starts, the time weighted emission result is to be calculated by weighting the cold-start emissions by one-seventh (1/7) and the hot-start emissions by six-sevenths (6/7) as shown below. If the applicant chooses not to do the final durability baseline test, it must use the initial durability baseline test results to calculate reductions for both the initial control and final control tests.

Weighted Emission Result = 1/7* average cold-start emissions + 6/7* average hot-start emissions

(2) The absolute emission level is the average control emission level, as defined in the following equation:

$$\text{Absolute Emission Level} = \frac{\Sigma\,(\text{control}_{AVG})}{\text{Number of control test sets}}$$

(b) Categorization of the Diesel Emission Control Strategy. ARB categorizes diesel emission control strategies to reduce PM and NOx emissions based on their verified emission reductions. Diesel emission control strategies that reduce NOx will be assigned their verified emission reduction in five percent

increments. Diesel emission control strategies are categorized by their PM reductions as follows:

(1) Level one: the system has been demonstrated under these procedures to reduce PM emissions by at least 25 percent but less than 50 percent from the baseline emission level.

(2) Level two: the system has been demonstrated under these procedures to reduce PM emissions by at least 50 percent but less than 85 percent from the baseline emission level.

(3) Level three: the system has been demonstrated under these procedures to reduce PM emissions by at least 85 percent from the baseline emission level, or to achieve PM emission levels of 0.01 grams per brake-horsepower-hour (g/bhp-hr) or less.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018 and 43105, 43600, 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, and 43204-43205.5 Health and Safety Code; Title 17 California Code of Regulations Section 93000.

§ 2709. In-Use Compliance Requirements

(a) Applicability. These in-use compliance requirements apply to all diesel emission control strategies for on-road, off-road, and stationary applications. It is the responsibility of the applicant to perform in-use compliance testing for each verified diesel emission control strategy family (see Section 2706(g)(2)). Testing is required when 50 units within a given diesel emission control strategy family have been sold in the California market. Applicants must submit an in-use compliance testing proposal for approval by the Executive Officer prior to the in-use compliance testing.

(b) Test Phases. In-use compliance testing, as described below in (c), (d), and (e), must be conducted at two different phases for each diesel emission control strategy family:

(1) Phase 1. Applicants must obtain and test diesel emission control systems once they have been operated for at least one year or within three months of their first maintenance, whichever comes first.

(2) Phase 2. Applicants must obtain and test diesel emission control systems once they have been operated between 60 and 80 percent of their minimum warranty period.

(c) Selection of Diesel Emission Control Systems for Testing. For each diesel emission control strategy family and for both test phases, the Executive Officer will identify a representative sample of engines or vehicles equipped with diesel emission control systems for in-use compliance testing. The engines or vehicles equipped with the selected diesel emission control

systems must have good maintenance records and may receive a tune-up or normal maintenance prior to testing. The applicant must obtain information from the end users regarding the accumulated mileage or hours of usage, maintenance records (to the extent practicable), operating conditions and a description of any unscheduled maintenance that may affect the emission results.

(d) Number of Diesel Emission Control Systems to be Tested. The number of diesel emission control systems an applicant must test in each of the two test phases will be determined as follows:
   (1) A minimum of four diesel emission control systems in each diesel emission control strategy family must be tested. For every system tested that does not reduce emissions by at least 90 percent of the lower bound of its initial verification level (or does not achieve an emission level less than or equal to 0.011 g/bhp-hr), two more diesel emission control systems from the same family must be obtained and tested. The total number of systems tested shall not exceed ten per diesel emission control strategy family.
   (2) At the discretion of the Executive Officer, applicants may begin by testing more than the minimum of four diesel emission control systems. Applicants may concede failure of an emission control system before testing a total of ten diesel emission control systems.

(e) In-use Compliance Emission Testing. Applicants must follow the testing procedure used for emission reduction verification as described in Section 2703 (both baseline and control tests are required). In addition, applicants must select the same test cycle(s) that they used to verify the diesel emission control strategy originally. If a diesel emission control strategy verified by U.S. EPA must perform engine dynamometer testing with the Heavy-duty Transient FTP cycle to fulfill the in-use compliance requirements of that program, but was verified by ARB with chassis dynamometer testing, the Executive Officer will also accept testing with the Heavy-duty Transient FTP cycle for the in-use compliance requirements of this Procedure. If a diesel emission control strategy fails catastrophically during the in-use compliance testing, the applicant must provide an investigative report detailing the causes of the failure to the Executive Officer within 90 days of the failure.

(f) The Executive Officer may approve an alternative to the in-use testing described above, on a case by case basis, if such testing is overly burdensome to either the applicant or to the end-users due to the nature of the industry the particular diesel emission control systems are used in. The proposed alternative must use scientifically-sound methodology and be designed to determine whether the diesel emission control strategy is in compliance with the emission reductions the Executive Officer verified it to.

(g) The Executive Officer may, with respect to any diesel emission control strategy sold, offered for sale, or manufactured for sale in California, order the applicant or strategy manufacturer to make available for compliance testing and/or inspection a reasonable number of diesel emission control systems, and may direct that they be delivered at the applicant's expense to the state board at the Haagen-Smit Laboratory, 9528 Telstar Avenue, El Monte, California or where specified by the Executive Officer. The Executive Officer may also, with respect to any diesel emission control strategy being sold, offered for sale, or manufactured for sale in California, have an applicant compliance test and/or inspect a reasonable number of units at the applicant or manufacturer's facility or at any test laboratory under the supervision of an ARB Enforcement Officer.

(h) In-Use Compliance Report. The applicant must submit an in-use compliance report to the Executive Officer within three months of completing both phases of testing. The following information must be reported for each of the minimum of eight diesel emission control systems tested:
(1) Parties involved in conducting the in-use compliance tests.
(2) Quality control and quality assurance information for the test equipment.
(3) Diesel emission control strategy family name and manufacture date.
(4) Vehicle or equipment and type of engine (engine family name, make, model year, model, displacement, etc.) the diesel emission control system was applied to.
(5) Estimated mileage or hours the diesel emission control system was in use.
(6) Results of all emission testing.
(7) Summary of all maintenance, adjustments, modifications, and repairs performed on the diesel emission control system.

(i) The Executive Officer may request the applicant to perform additional in-use testing if the warranty claims exceed two percent of the number of diesel engines using the diesel emission control strategy, or based on other relevant information.

(j) Conditions for Passing In-Use Compliance Testing. For a diesel emission control strategy to pass in-use compliance testing, emission test results must indicate that the strategy reduced emissions by at least 90 percent of the lower bound of the emission reduction level the Executive Officer originally verified it to. If the first four diesel emission control systems tested within a diesel emission control strategy family meet this standard, the diesel emission control strategy passes in-use compliance testing. If any of the first four diesel emission control systems tested within a diesel emission control strategy family fail to reduce emissions by at least 90 percent of the lower bound of the emission reduction level the Executive Officer originally verified it to, and more than four units are tested, at least 70 percent of all units tested must pass the 90 percent standard for the diesel emission control strategy family to pass in-use compliance testing. For each failed test, for which the

cause of failure can be attributed to the product and not to maintenance or other engine-related problems, two additional units must be tested, up to a total of ten units per diesel emission control strategy family.

(k) Failure of In-use Compliance Testing. If a diesel emission control strategy family does not meet the minimum requirements for compliance, the applicant must submit a remedial report within 90 days after the in-use compliance report is submitted. The remedial report must include:
(1) Summary of the in-use compliance report.
(2) Detailed analysis of the failed diesel emission control systems and possible reasons for failure.
(3) Remedial measures to correct or replace failed diesel emission control systems as well as the rest of the in-use diesel emission control systems.

(l) The Executive Officer may evaluate the remedial report, annual warranty report, and all other relevant information to determine if the diesel emission control strategy family passes in-use compliance testing. The Executive Officer may request more information from the applicant. Based on this review, the Executive Officer may lower the verification level or revoke the verification status of a verified diesel emission control strategy family. The Executive Officer may also lower the verification level or revoke the verification status of a verified diesel emission control strategy family, if the applicant does not conduct in-use compliance testing in accordance with this section, or if the Executive Officer conducts in-use compliance testing in accordance with this section (including alternative testing) and the diesel emission control strategy family does not pass the standards in this section.

(m) The Executive Officer may lower the verification level or revoke the verification status of a verified diesel emission control strategy family if the applicant fails to observe the requirements of Sections 2706 or 2707. The Executive Officer must allow the applicant an opportunity to address the possible lowering or revocation of the verification level in a remedial report to the Executive Officer and the Executive Officer may make this determination based on all relevant information.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018 and 43105, 43600, 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, and 43204-43205.5 Health and Safety Code; Title 17 California Code of Regulations Section 93000.

§ 2710. Verification of Emission Reductions for Alternative Diesel Fuels

(a) Applicability. This section applies to in-use strategies that include emission reductions from the use of alternative diesel fuels. For the purpose of this

procedure, alternative diesel fuels mean fuels that are used in diesel engines that are not reformulated diesel fuels as defined in Sections 2281 and 2282 of Title 13, of the California Code of Regulations and do not require engine or fuel system modifications to operate, although minor modifications (e.g. recalibration of the engine fuel control) may enhance performance. The requirements in this section are in addition to those in Sections 2700-2709, except as specifically noted.

(b) Alternative Diesel Fuel Proposed Test Protocol. The applicant must submit a proposed test protocol which includes:
(1) References to criteria pollutant and toxic emissions sampling and analyses that are consistent with the requirements of the Procedure.
(2) Description and Parameters of Alternative Diesel Fuels.
(A) The applicant must describe the applicability of the alternative diesel fuel to diesel engines and identify any requirements for engine or fuel system modifications.
(B) The applicant must provide a general description of the alternative diesel fuel that includes the fuel type, fuel characteristics, fuel properties, fuel formulation, and chemical composition. The applicant for the candidate alternative diesel fuel must specify the following:
(i) Identity, chemical composition, and concentration of fuel additives
(ii) Sulfur content
(iii) Total aromatic content
(iv) Total polycyclic aromatic hydrocarbon content
(v) Nitrogen content
(vi) API gravity (density)
(vii) Distillation temperature distribution information, initial boiling point (IBP),
(viii) 10% recovered (REC), 5O% REC, 90% REC, and end point (EP)
(C) The applicant must provide information on the candidate alternative diesel fuel that may affect engine performance, engine wear, and safety. The applicant for the candidate alternative diesel fuel must specify the following:
(i) Viscosity (engine performance)
(ii) Fuel volatility (engine performance)
(iii) Ignition quality (engine performance)
(iv) Fuel operating temperatures (engine performance)
(v) Engine wear tendencies (engine wear)
(vi) Corrosion (engine wear)
(vii) Lubricity (engine wear)
(viii) Fuel flash point (safety)
(D) The applicant must provide information on the candidate alternative diesel fuel to determine if there are chemicals in the fuel that may increase levels of toxic compounds or potentially form toxic compounds in the fuel. The applicant will conduct an analysis for metals and elements by a method specified by the applicant. Copper,

iron, cerium, lead, cadmium, chromium, and phosphorus must be included in the analysis. Additional analysis for other toxic compounds may be required after reviewing the chemical composition of the candidate alternative diesel fuel and its additives. (Note: For emulsified diesel fuels, a toxic analysis of the diesel base fuel is not necessary).

(E) With the approval of the Executive Officer or designee, an applicant may also specify different fuel parameters and test methods that are appropriate to better characterize the candidate alternative diesel fuel.

(F) Upon review of the proposed test protocol, the executive officer or designee may require additional fuel components, parameters, and specifications to be determined.

(3) Reference Fuel Specifications. The reference fuel used in the comparative testing described in Section 2710(d) allows the applicant three options in selecting a reference fuel.

(A) Option (1). The first option is to use a California produced 10% reference fuel. The reference fuel must be produced from straight-run California diesel fuel by a hydrodearomatization process and must have the characteristics set forth below under "Reference Fuel Specifications" (the listed ASTM methods are incorporated herein by reference).

(B) Option (2). The second option is to make the reference fuel from a custom blend using a "like" California diesel fuel made from a straight-run California diesel fuel by a hydroaromatization process and must have the characteristics set forth below under "Reference fuel Specifications. In addition the reference fuel must exhibit the bell shaped distillation curve characteristic of diesel fuel and no chemical feedstocks or pure chemicals such as solvents can be used as blend stocks. Details of the source and specifications of the feedstocks must be provided in the protocol and the processes and diesel feedstocks used to make the reference fuel must be reviewed and approved by the ARB.

(C) Option (3). For alternative diesel fuels that contain diesel as a base fuel such as emulsified diesel fuel and 80:20 biodiesel fuel, the base diesel fuel used to make the alternative diesel fuel can be used in place of the 10 percent reference fuel. The base diesel fuel must be a certified, commercially available diesel fuel sold in California. The sulfur content, aromatic hydrocarbon content, polycyclic aromatic hydrocarbon content, nitrogen content, natural cetane number, API gravity, viscosity, and distillation specifications must be provided for the base diesel fuel used for the reference fuel.

Table 6. Reference Fuel Specifications

Property	General Reference Fuel Specifications	ASTM Test Method
Sulfur Content	500 ppm max	D5453-93
Aromatic Hydrocarbon content, Vol. %	10% max	D5186-96
Polycyclic Aromatic Hydrocarbon content %	1.4% max	D5186-96
Nitrogen Content	10 ppm max	D4629-96
Natural Cetane Number	48 min	D613-84
Gravity, API	33-39	D287-82
Viscosity at 40^{o}, cSt	2.0-4.1	D445-83
Flash point, ^{o}F	130	D93-80
Distillation, ^{o}F IBP 10%REC 50%REC 90%REC EP	 340-420 400-490 470-560 550-610 580-660	D86-96

(4) The identity of the entity proposed to conduct the tests described in Section 2710(d);
(5) Reasonably adequate quality assurance and quality control procedures;
(6) Notification of any outlier identification and exclusion procedure that will be used, and
(7) A demonstration that any procedure meets generally accepted statistical principles.

(c) Application for Alternative Diesel Fuel Emission Reduction Verification. Upon completion of the tests, the applicant may submit an application for verification to the executive officer or designee. The application must follow the format in Section 2702(d) as applicable and include:
(1) The approved test protocol,
(2) All of the test data,
(3) Copy of the complete test log prepared in accordance with Section 2710(d)(3)(B),
(4) A demonstration that the candidate alternative diesel fuel meets the requirements for verification set forth in this section, and
(5) Such other information as the executive officer or designee may reasonably require.

(d) Emissions Test Procedures for Particulates, Nitrogen Oxides, Soluble Organic Fraction, Hydrocarbons, and Toxics.
(1) Criteria pollutants test requirements. In each test of a fuel, exhaust emissions of NO_x, PM, and hydrocarbons must be measured. In addition,

for each test the soluble organic fraction (SOF) of the particulate matter in the exhaust emissions must be determined in accordance with the Air Resources Board's "Test Method for Soluble Organic Fraction (SOF) Extraction " dated April 1989, which is incorporated herein by reference.

(2) Toxic emissions sampling and analysis requirements. Exhaust emissions of formaldehyde, acetaldehyde, benzene, toluene, ethyl benzene, xylenes, butadiene, and polycyclic aromatic hydrocarbons are to be sampled and analyzed as specified in Table 7.

Table 7. Toxics sampling and analysis [1,2]

Toxics	Method
Formaldehyde and acetaldehyde	ARB SOP 104
Benzene toluene, ethyl benzene, xylenes, and butadiene	ARB SOP 102/103
Polycyclic aromatic hydrocarbons	ARB method 429[3]

[1]Additional toxics sampling may be required depending on the chemical composition of the additives in the fuel.

[2]At a minimum tunnel blanks are required prior to and after conducting toxic emissions sampling for the reference fuel and candidate alternative diesel fuel.

[3]PAH sampling consists of a filter to collect particulate PAHs and XAD resin to collect volatile PAHs. The sampling protocol needs to be included in the test protocol. Analysis of the samples will be performed by ARB method 429.

(3) Test sequence for emissions test program.

(A) The applicant must use one of the following test sequences:

(i) If both cold start and hot start exhaust emission tests are conducted, a minimum of five exhaust emission tests must be performed on the engine with each fuel, using either of the following sequences, where "R" is the reference fuel and "C" is the candidate alternative diesel fuel: RC CR RC CR RC (and continuing in the same order). The engine mapping procedures and a conditioning transient cycle must be conducted with the reference fuel before each cold start procedure using the reference fuel. The reference cycle used for the candidate alternative diesel fuel must be the same as determined for the reference fuel.

(ii) If only hot start exhaust emission tests are conducted, one of the following test sequences must be used throughout the testing, where "R" is the reference fuel and "C" is the candidate alternative diesel fuel:

Alternative 1: RC CR RC CR (continuing in the same order for a given calendar day; a minimum of twenty individual exhaust emission tests must be completed with each fuel)

Alternative 2: RR CC RR CC (continuing in the same order for a given calendar day; a minimum of twenty individual exhaust emission tests must be completed with each fuel)

Alternative 3: RRR CCC RRR CCC (continuing in the same order for a given calendar day: a minimum of twenty-one individual exhaust emission tests must be completed with each fuel)

For all alternatives, an equal number of tests must be conducted using the reference fuel and the candidate alternative diesel fuel on any given calendar day. At the beginning of each calendar day, the sequence of testing must begin with the fuel that was tested at the end of the preceding day. The engine mapping procedures and a conditioning transient cycle must be conducted at the beginning of each day for the reference fuel. The reference cycle used for the candidate alternative diesel fuel must be the same as determined for the reference fuel.

(B) The applicant must submit a test schedule to the executive officer or designee at least one week prior to commencement of the tests. The test schedule must identify the days on which the tests will be conducted, and must provide for conducting test consecutively without substantial interruptions other than those resulting from the normal hours of operations at the test facility. The executive officer or designee should be permitted to observe any tests. The party conducting the tests must maintain a test log which identifies all tests conducted, all engine mapping procedures, all physical modifications to or operational tests of the engine, all recalibrations or other changes to the test instruments, and all interruptions between tests, and the reason for each interruption. The party conducting the tests or the applicant must notify the executive officer or designee by telephone and in writing of any unscheduled interruption resulting in a test delay of 48 hours or more, and the reason for such delay. Prior to restarting the test, the applicant or person conducting the tests must provide the executive officer or designee with a revised schedule for the remaining tests. All tests conducted in accordance with the test schedule, other than any test rejected in accordance with an outlier identification and exclusion procedure included in the approved test protocol, must be included in the comparison of emissions.

(C) Upon approval of the executive officer or designee, the applicant may specify an alternative test sequence to Section 2710(d)(3)(A). The applicant must provide the rationale demonstrating that the alternative test sequence better characterizes the average emissions difference between the reference fuel and the alternative diesel fuel.

(e) Durability.

(1) The applicant must meet the durability testing requirements in Section 2704.

(2) The applicant must provide test data showing that the candidate alternative diesel fuel does not adversely affect the performance and operation of diesel engines or cause premature wear or cause damage to diesel engines. This must include but is not limited to lubricity, corrosion, and damage to engine parts such as fuel injector tips. The applicant must provide data showing under what temperature and conditions the candidate alternative diesel fuel remains stable and usable in California.

(f) Other Requirements. The candidate fuel must be in compliance with applicable federal, state, and local government requirements.

(1) The candidate fuel must be in compliance with applicable federal, state, and local government requirements.

(2) Applicants planning to market fuel in California must contact the US EPA and the California Dept. of Food and Agriculture. Contacts are listed below.

Office of Transportation and Air Quality
USEPA Head Quarters
Ariel Rios Blvd.
1200 Pennsylvania Ave, N.W.
Washington DC 20468
Phone (202) 564-9303

Petroleum Products/Weighmaster Enforcement Branch
Division of Measurement Standards
Dept. of Food and Agriculture
8500 Fruitridge Road, Sacramento CA 95826
Phone (916) 229-3000

(3) Additional government agencies such as the California Energy Commission, Area Council Governments, and Local Air Quality Management Districts may be contacted to facilitate the marketing of alternative diesel fuel in California.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018 and 43105, 43600, 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, and 43204-43205.5 Health and Safety Code; Title 17 California Code of Regulations Section 93000.